

GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF MAY 8, 1993

1. Hawaii:

DRY WEATHER PERSISTS.

Up to 50 mm of rain dampened the Big Island, but little or no precipitation was reported elsewhere. Six-week deficits of 50 to 70 mm were common, with the largest shortfalls on the island of Kauai [13 weeks].

2. South-Central Alaska:

WARM CONDITIONS DIMINISH.

Temperatures averaged only 1°C to 3°C above normal and were restricted to southern sections of the state as the intensity and extent of unusually mild weather decreased [Ending at 5 weeks].

3. West-Central North America:

AREA REMAINS ABNORMALLY WET.

Moderate rains of 30 to 75 mm moistened much of Oregon, Washington, and British Columbia. Six-week precipitation surpluses exceeded 50 mm throughout the region, reaching 150 mm in parts of Oregon [8 weeks].

4. East-Central North America:

WET WEATHER SHIFTS WESTWARD.

Severe thunderstorms dumped up to 200 mm of rain on Oklahoma, Kansas, and Iowa (see front cover). Farther east, the northeastern United States and southeastern Canada received less than 30 mm of precipitation, but six-week moisture surpluses remained as high as 150 mm in the mid-Atlantic region [13 weeks].

5. Central South America:

STILL UNUSUALLY DRY.

Rainfall totals were generally below 30 mm in Bolivia, Paraguay, and most of eastern and central Brazil. Six-week moisture deficits approached 170 mm in parts of Paraguay and southern Bolivia and reached 260 mm in portions of eastern Brazil [12 weeks].

6. Chile:

HEAVY RAINS INUNDATE COUNTRY.

Up to 130 mm of rain inundated central Chile. According to press reports, several lives were lost and a bridge and two power stations were damaged by flooding caused by the rare heavy rains [Episodic Event].

7. Europe:

WARM CONDITIONS PERSIST AS DRYNESS DEVELOPS.

Precipitation amounts were generally below 30 mm, except for scattered totals of 40 to 60 mm in the Alps. During the past four weeks, the developing dry conditions were exacerbated by above normal temperatures. Last week, departures reached +8°C in Finland and Russia [4 weeks].

8. Southwestern Asia:

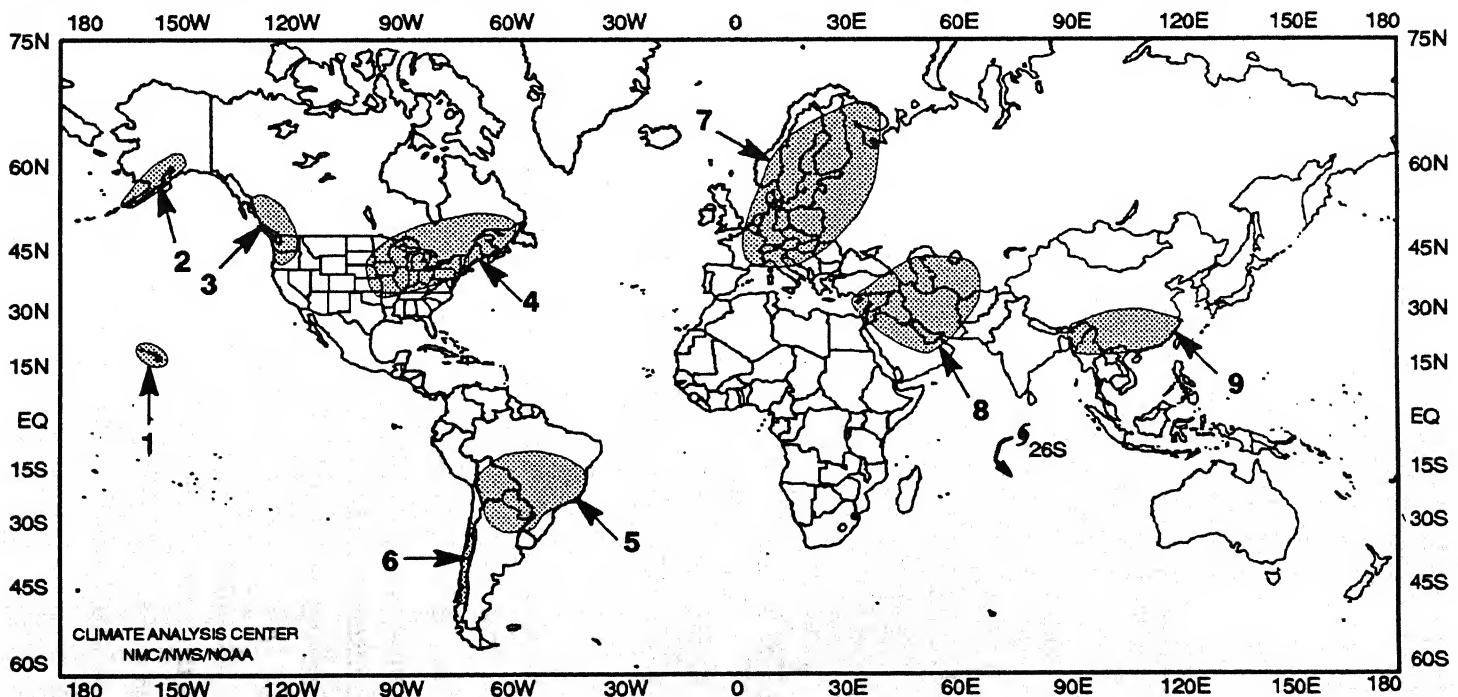
COLD AND WET WEATHER CONTINUES.

Temperatures averaged 3°C to 5°C below normal as rains of 30 to 60 mm dampened much of the region. According to press reports, torrential downpours in Uzbekistan resulted in extensive flooding of cotton-growing areas [7 weeks].

9. Southeastern Asia:

DELUGING RAINFALL CAUSES FLOODING.

Up to 190 mm of rain drenched the region, triggering serious flooding in China and extreme eastern India. According to press reports, floods in Guangdong claimed several lives and left thousand homeless while threatening a dike that protects millions of individuals in Canton. Press reports from India indicate that nearly 50,000 individuals lost their homes to flash floods that extensively damaged highways and rice fields [4 weeks].



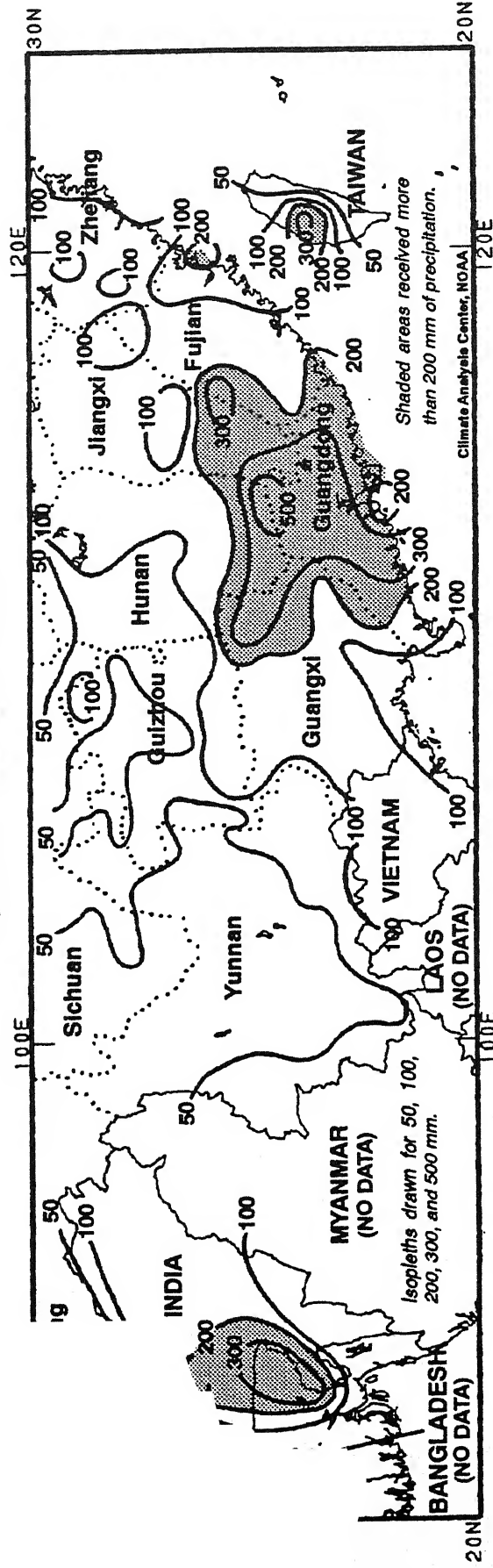
EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

TOTAL PRECIPITATION (MM)

April 25 – May 9, 1993



HEAVY RAINS GENERATE FLOODING ACROSS PORTIONS OF SOUTHERN CHINA AND EXTREME EASTERN INDIA. During the 15-day period, portions of southern China, extreme eastern India, and Bangladesh received 200 to 500 mm of rain, although reliable data are lacking in the latter country. These rains primarily resulted from heavy thunderstorms that dropped large amounts of precipitation in short periods of time (daily totals reached 135 mm in northern Guangdong and approached 100 mm in easternmost India), resulting in several outbreaks of severe flooding. Forty villages were submerged in the Indian state of Assam, leaving 50,000 individuals homeless, while over 13,000 additional dwellings were destroyed by floods in Tripura, according to press reports. Farther east, possibly the worst flooding in 200 years afflicted Guangdong, taking four lives, leaving thousands homeless, and threatening a dike along the Beiji River near Canton that protects 4.5 million people. In addition, severe hailstorms took four lives, injured over a dozen individuals, and damaged hundreds of houses in the Vietnamese village of Son Thuy, northwest of Hanoi. Another hailstorm, accompanied by gale-force winds, took nearly three dozen lives, injured almost 400 people, and destroyed 30,000 dwellings in China's Sichuan province.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF MAY 2 – 8, 1993

Slow-moving storms generated widespread thunderstorms that raked much of the Northwest, northern and west-central Rockies, Great Plains, Mississippi and Ohio Valleys, Southeast, Appalachians, and mid-Atlantic with strong winds, large hail, tornadoes, and heavy rain that caused extensive flash flooding. Early in the week, five inches of rain deluged Drumwright, OK, buckling roads and inundating several businesses and dozens of houses. Heavy rain and winds gusting to 75 mph lashed Salt Lake City, UT. On Wednesday, at least two people died when nearly eight inches of rain inundated parts of the San Antonio, TX area, flooding streets and causing creeks and streams to overflow their banks, according to press reports. Interstate 35 was closed when several feet of water covered the freeway. During the latter part of the week, severe flooding was reported along the Hondo and Guadalupe Rivers in southern Texas, the Des Moines and Raccoon Rivers in central Iowa, the Big Sioux in southeastern South Dakota (exceeding record levels), and the Rock River in southwestern Minnesota. Additional flooding was reported along small streams and creeks in east-central and northeastern Kansas and north central and southwestern Missouri. Intense thunderstorms spawned numerous tornadoes throughout the week in the Mississippi Valley, the Southeast, and the central and southern Plains. On Monday, a tornado at Brookwood, AL damaged fifty homes. From Friday morning to Saturday morning, at least seventy twisters touched down, causing damage in parts of Minnesota, South Dakota, Nebraska, and Kansas. A woman was killed by a tornado near Lake Wilson, KS, while a truck driver died in South Dakota in a wreck blamed on high winds, according to press reports.

At the start of the week, showers and thunderstorms along and ahead of a slow-moving frontal system produced heavy rain in the southeastern and east-central Plains and middle and lower Mississippi Valley. Severe thunderstorms spawned tornadoes and up to tennis-ball-sized hail across southeastern Texas and southern Louisiana. On Monday, this system moved eastward, spreading moderate to heavy rain into the Southeast, Ohio Valley, and Great Lakes. Strong thunderstorms covered western Alabama, northern Mississippi, and western Tennessee. On Tuesday, showers and thunderstorms reached from Georgia and the Carolinas to the middle Mississippi Valley and Great Lakes as torrential rains drenched the southern Appalachians. Elsewhere, showers and thunderstorms were scattered across the Northwest and northern and west-central Rockies, where wind gusts to 60 mph downed numerous trees, closing numerous roads in Oregon and Idaho. Heavy late-season snow brought substantial accumulations in the higher elevations of the Pacific Northwest and Rockies.

At mid-week, the eastern frontal system brought locally heavy rain to the Northeast and mid-Atlantic before dissipating.

Meanwhile, a second system brought more severe weather to the Plains, with tornadoes damaging roofs and uprooting trees in Nebraska and Oklahoma. Thunderstorms brought large hail and powerful winds from South Dakota to Texas. During the latter part of the week, the system stalled, allowing showers and thunderstorms to continue to soak much of the Plains and middle and upper Mississippi Valley. Flash flooding, tornadoes, hail, and high wind gusts repeatedly ravaged some locations. Warm air ahead of this system brought a half dozen new daily high temperature records to the Midwest on Saturday. Farther west, showers and thunderstorms were widely scattered from the northern Pacific coast to the northern and central Rockies.

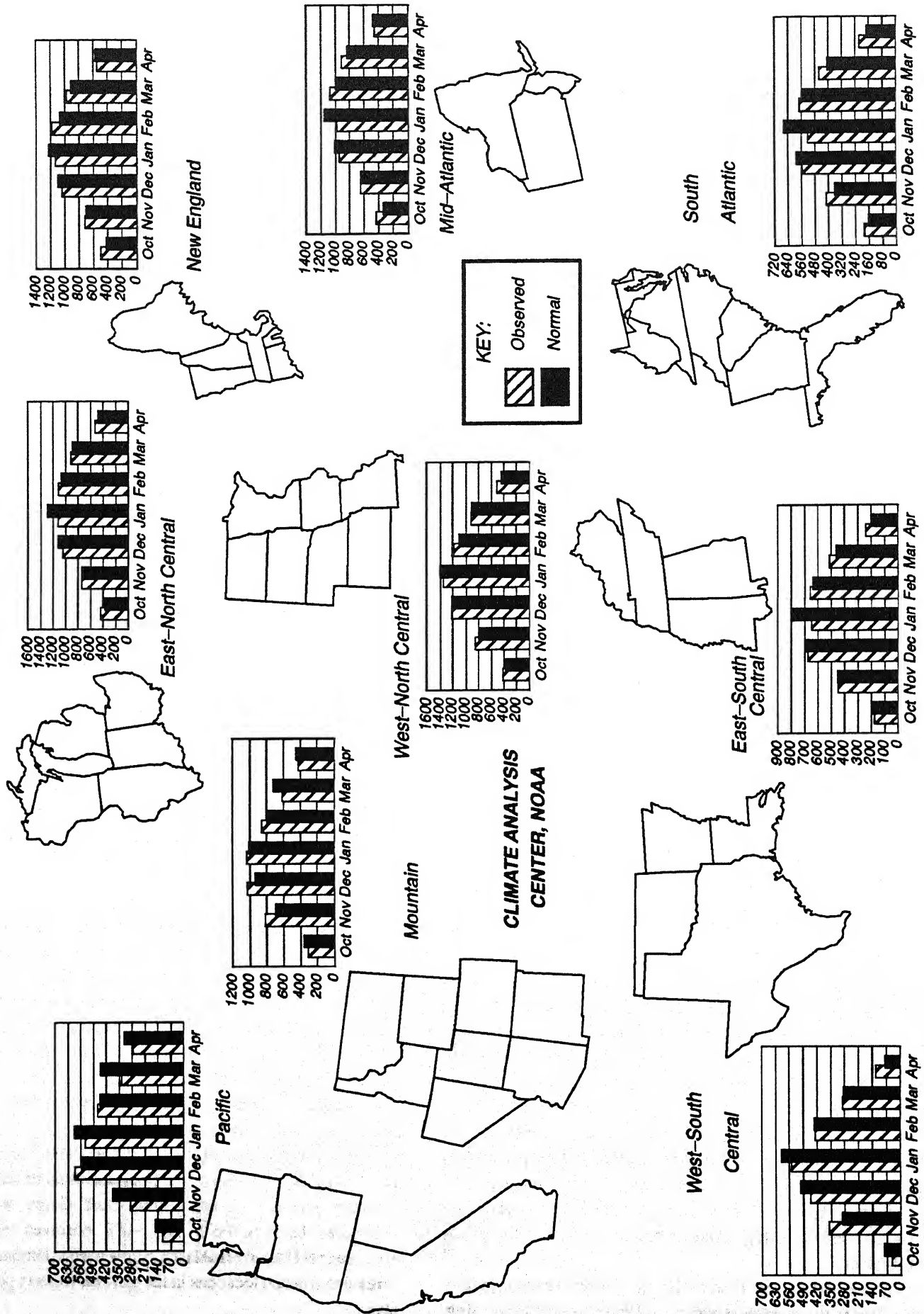
According to the River Forecast Centers, the greatest weekly precipitation totals (between two and nine inches) fell from the Red River Valley of Oklahoma and Texas northeastward to the upper middle Mississippi Valley and over southeastern South Dakota, southwestern Minnesota, southeastern Texas, the lower Ohio and Tennessee Valleys, the southern Appalachians, the west-central Rockies, and western Oregon. Amounts of more than two inches were also scattered across the northern Rockies, southern Alaska, and the remainders of the Plains, Mississippi Valley, Appalachians, Southeast, and Northwest. Light to moderate precipitation fell in northern California, the Big Island of Hawaii, and in the remainders of the Northwest, the northern and central Rockies, southern Alaska, and the eastern two-thirds of the contiguous United States. Little or no precipitation was observed in the southern Rockies, Desert Southwest, Great Basin, southern California, and the remainders of Alaska and Hawaii. Parts of Hawaii have now endured 13 successive weeks of subnormal precipitation.

Warmer than normal conditions enveloped most of the eastern half of the nation, the northern, central, and southern High Plains, southern California, southern Arizona, southern New Mexico, and the immediate northern Pacific coast, with weekly departures of +6°F to +12°F prevalent over the northern Plains, Midwest, Appalachians, and Northeast. In Alaska, warm conditions diminished somewhat, although weekly departures reached +5°F at King Salmon. Temperatures also continued to average up to 2°F above normal in Hawaii.

In contrast, cooler than normal conditions prevailed in the Northwest, the Great Basin, the Rockies, northern California, the southern Plains, and the central Gulf Coast, with weekly departures between -5°F and -8°F observed only in the west-central Rockies. In Alaska, below normal temperatures were limited to isolated locations in the extreme western portion of the state.

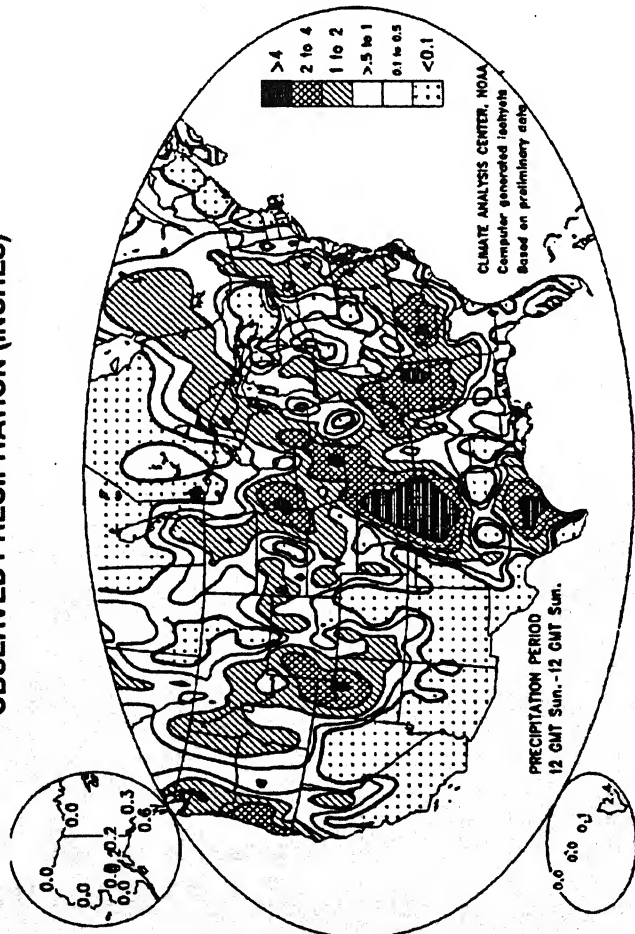
POPULATION-WEIGHTED HEATING DEGREE DAYS BY REGION

October 1992 – April 1993

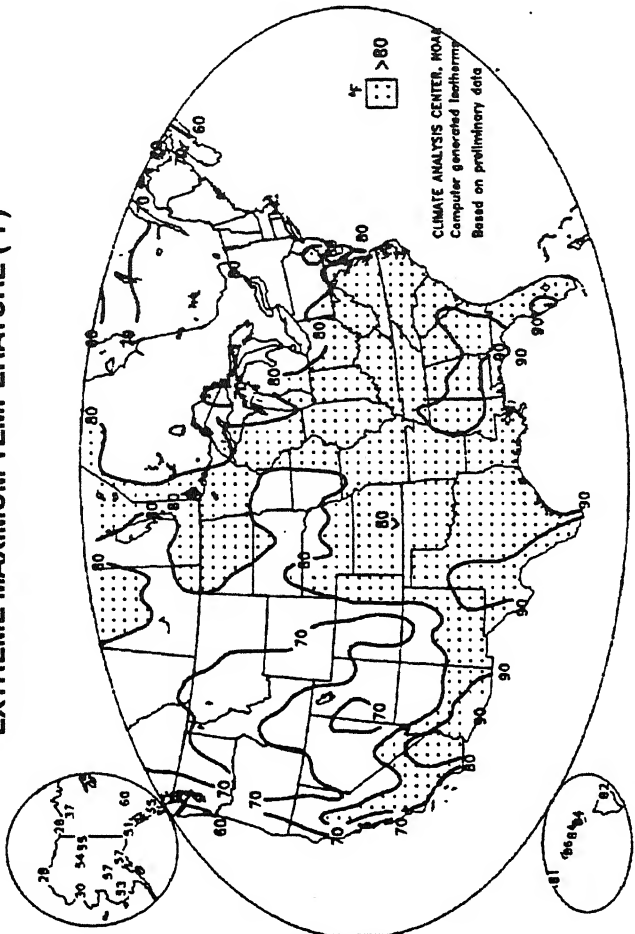


UNITED STATES WEEKLY CLIMATE CONDITIONS (MAY 2 - 8, 1993)

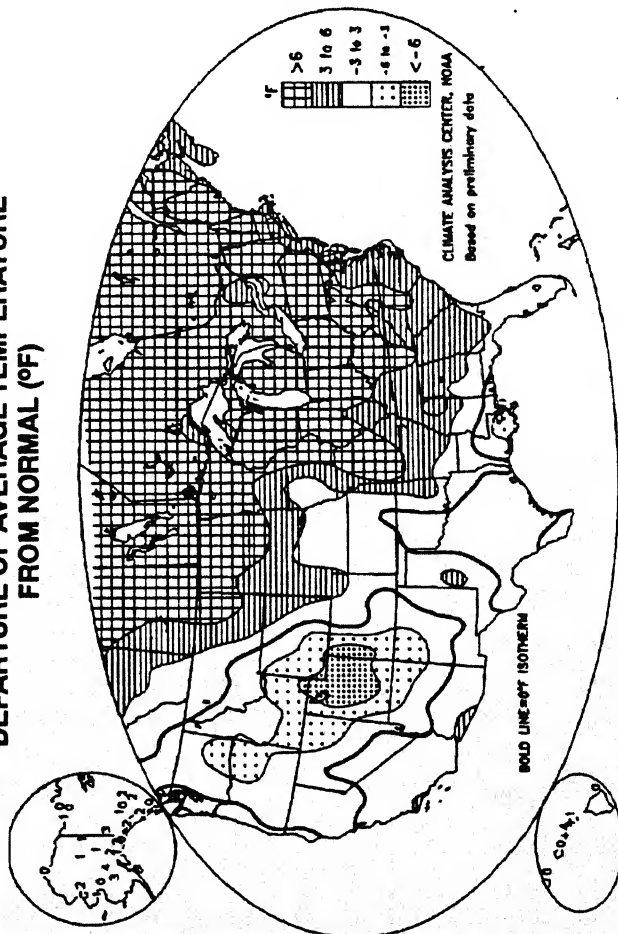
OBSERVED PRECIPITATION (INCHES)



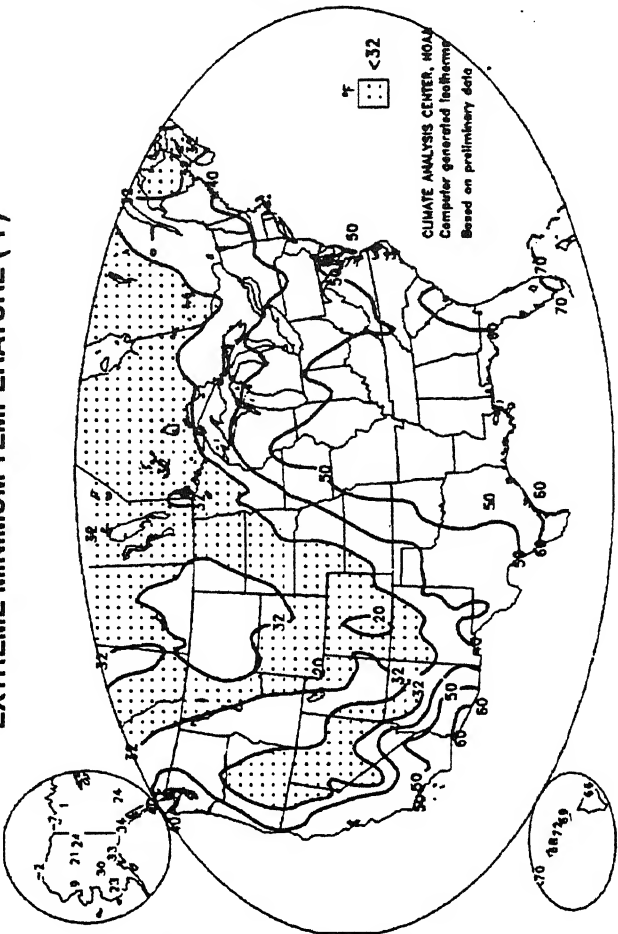
EXTREME MAXIMUM TEMPERATURE (°F)



DEPARTURE OF AVERAGE TEMPERATURE
FROM NORMAL (°F)

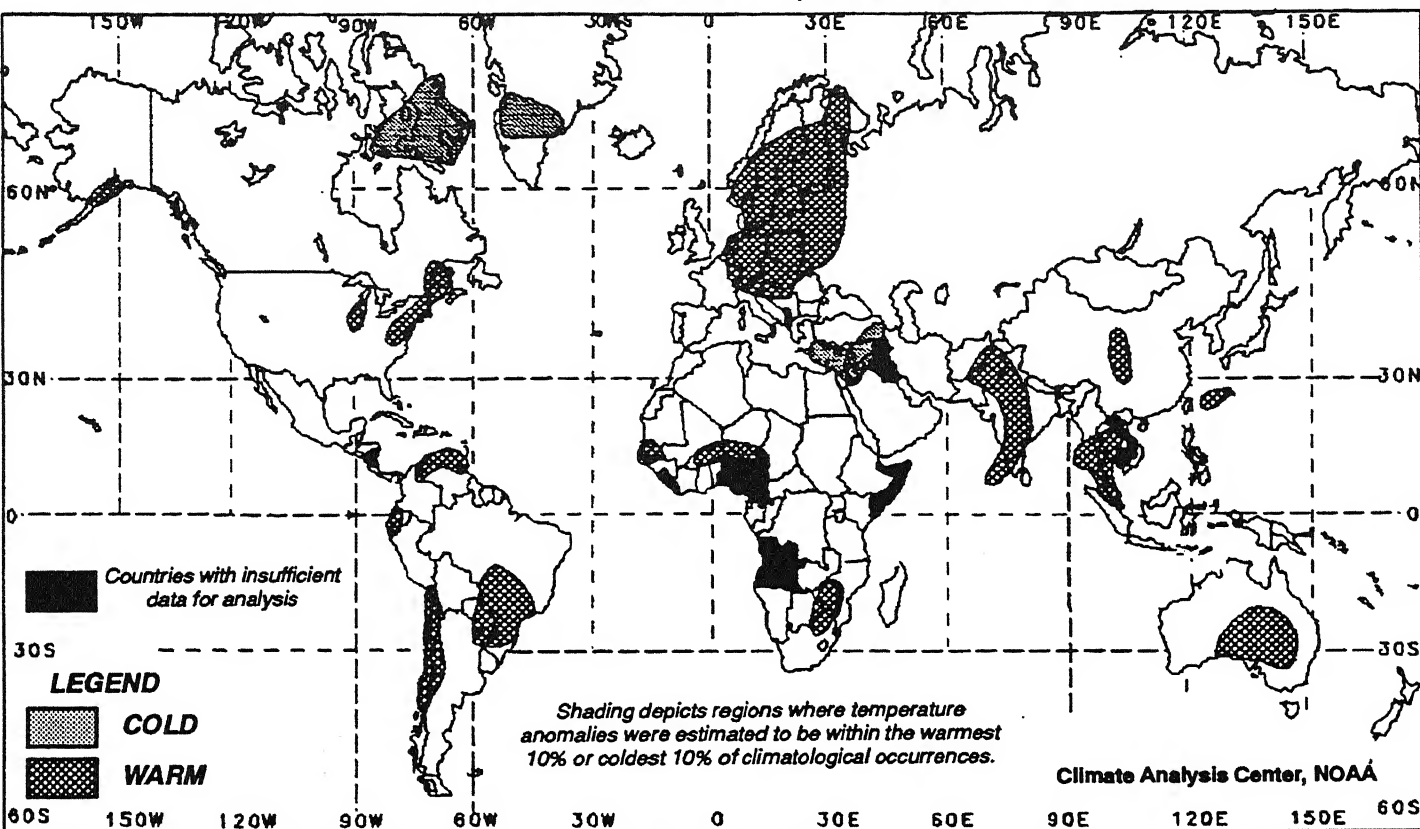


EXTREME MINIMUM TEMPERATURE (°F)



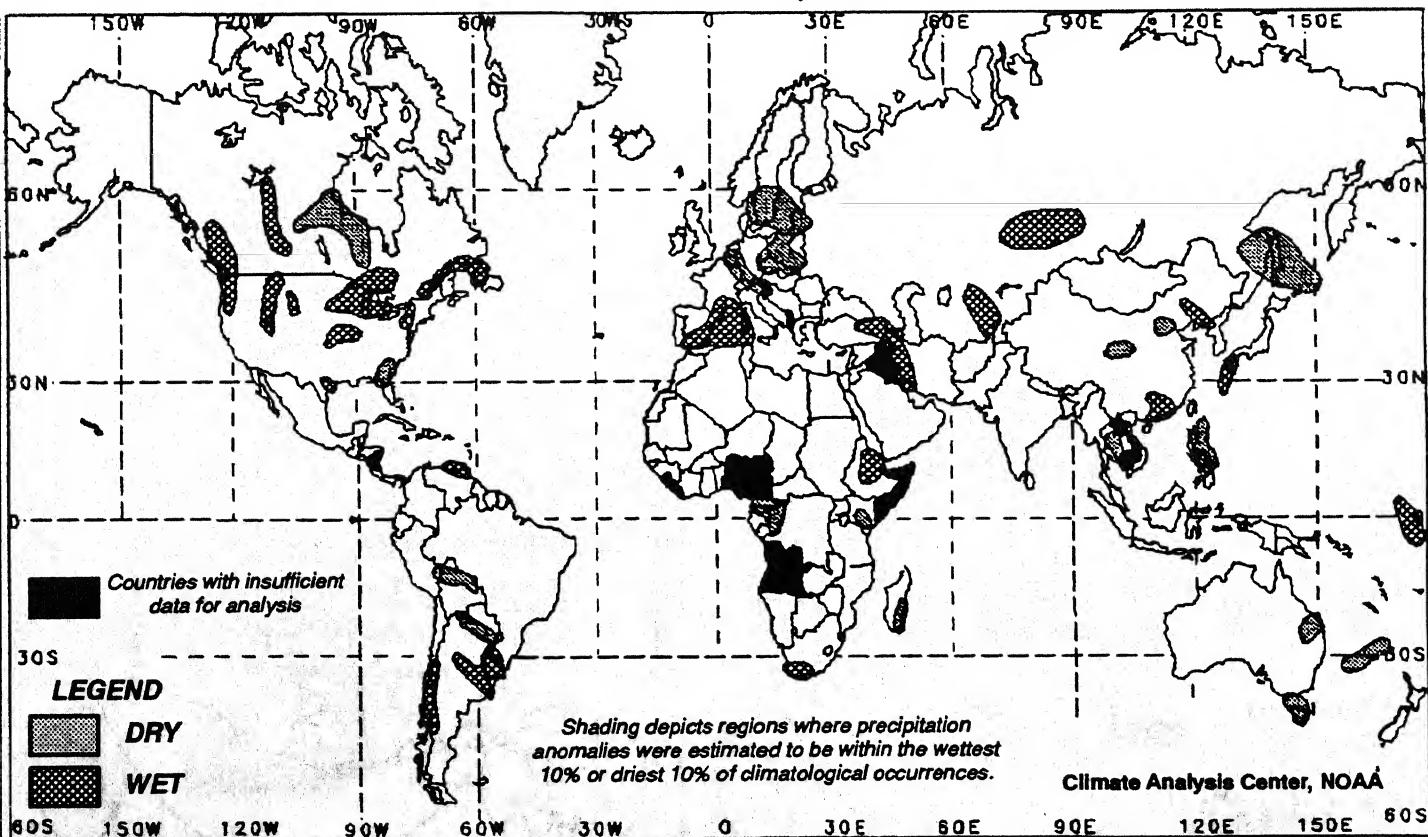
TWO-WEEK GLOBAL TEMPERATURE ANOMALIES

APRIL 25 – MAY 8, 1993



FOUR-WEEK GLOBAL PRECIPITATION ANOMALIES

APRIL 11 – MAY 8, 1993



UNITED STATES MONTHLY CLIMATE SUMMARY

APRIL 1993

A combination of heavy rain and melting snow at the beginning of the month caused widespread flooding across the middle Mississippi and the upper and middle Mississippi Valleys, the mid-Atlantic, and the Northeast. In Iowa, the Des Moines, Shell Rock, Iowa, and Cedar Rivers reached record levels while the Susquehanna River and its tributaries overflowed their banks at several locations in Pennsylvania. In addition, flooding plagued northern and central New Jersey, eastern New York, and southern New England. Farther west, above normal precipitation dampened the Far West from northern California northward into British Columbia for the first of four consecutive weeks.

Violent thunderstorms spawned tornadoes, gusty winds, and large hail across much of the South and Southeast during the first ten days of April. In Florida, twisters destroyed or damaged more than 70 buildings in Port Charlotte, almost a dozen homes in Manasota, and a couple of dwellings in Dade County. Meanwhile, at least three lives were lost in a tornado that swept across Grande Isle, Louisiana's only inhabited barrier island. Farther northwest, a late-season winter storm dumped up to seven inches of snow on the High Plains from southeastern Wyoming to central South Dakota. Nearly a foot buried portions of the central Rockies.

During the middle of the month, powerful thunderstorms pelted the east-central Plains and middle Mississippi Valley with locally heavy rains, strong winds, and large hail. Minor flooding was reported across western Missouri. Farther south, strong thunderstorms damaged roofs and downed trees and power lines in eastern Texas. Inundating rains swelled streams and rivers in the mid-Atlantic and aggravated flooding across the Northeast.

The third full week of April was punctuated by more thunderstorms. Locally heavy rain, large hail, and wind gusts to 60 mph buffeted Kansas, Nebraska, Iowa, Missouri, Arkansas, eastern Oklahoma, and northeastern Texas. Up to four inches of rain produced flash flooding from northern Iowa to southern Michigan. In addition, locally heavy rains in western New York exacerbated flooding for the third consecutive week. Meanwhile, a tornado tore through suburban Tulsa, OK, claiming several lives and destroying numerous buildings.

The month closed with another round of thunderstorms pounding the southern and central Plains and the lower Mississippi and Tennessee Valleys. Nearly seven inches of rain soaked central Oklahoma while tornadoes touched down in south-central Kansas and southwestern Oklahoma. In the Northeast, heavy rain and snow-melt combined to generate severe flooding along the shores of Lake Champlain, which rose to its highest level on record. A 1000-foot section of Bear Mountain, 15 miles south of Syracuse, NY, gave way in a mud slide that destroyed a few homes.

According to the River Forecast Centers, heavy precipitation (over four inches) drenched much of the Midwest, deep South, mid-Atlantic, and Northeast. Abundant rains also soaked the Pacific Northwest, with totals exceeding twice the normal (over one foot in a few locations) in Oregon and northern California (page 8). Based on preliminary calculations from the National Climatic Data Center (NCDC), six of the nine regions experienced above

median precipitation, with the Northeast and Northwest reporting the 4th wettest April since records began in 1895 (page 9). Of the 48 contiguous states, 36 observed above median precipitation, with Pennsylvania and New York experiencing the wettest April in 99 years of record. For the same period, Idaho and Louisiana ranked 3rd while Wisconsin, Oregon, and Michigan ranked 4th, 6th, and 7th, respectively. The nation as a whole reported the 36th wettest April on record. A few locations scattered across the Pacific Northwest, Ohio, and Pennsylvania established new April precipitation records (page 12). The month generally perpetuated the rather damp pattern that has dominated the Nation this year. For January–April, eight states (AZ, LA, NY, NC, PA, RI, UT, and VA) experienced one of the ten wettest such periods on record, with New York and Pennsylvania enduring the wettest start to a year since records began. In contrast, only five states (KY, MT, ND, TN, and WA) reported submedian four-month totals.

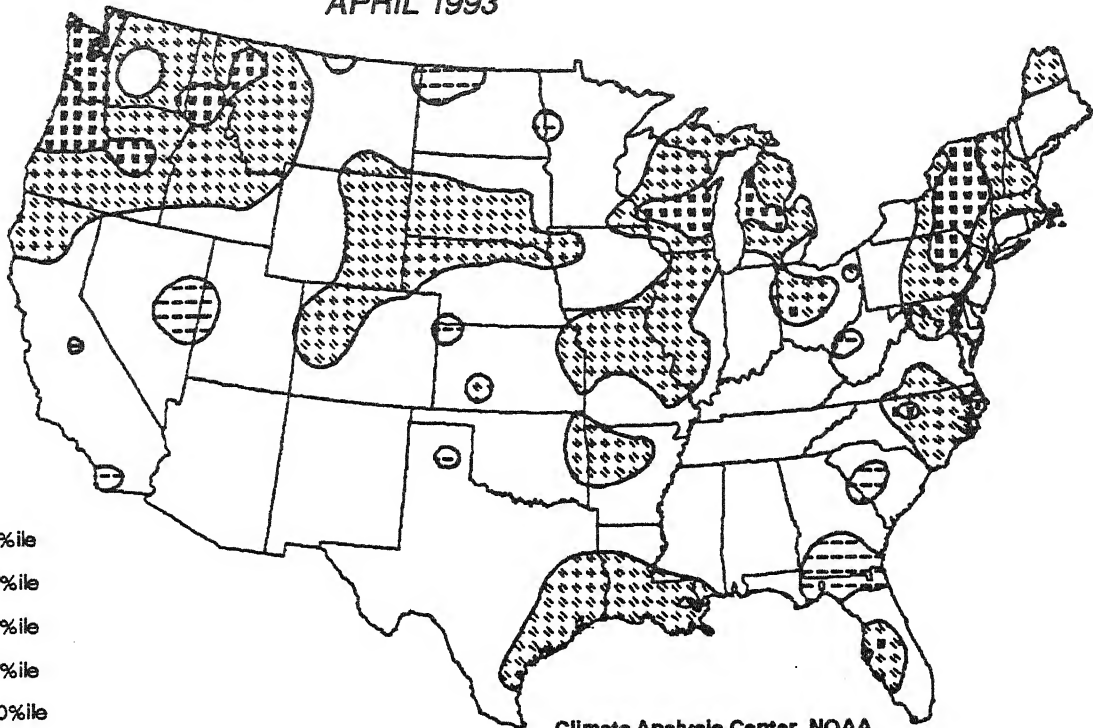
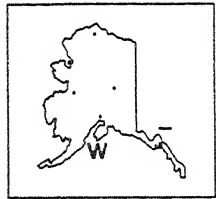
Below normal precipitation was limited to the Southwest, southwestern Texas, the far northern Plains, the Ohio and Tennessee Valleys, and parts of the Southeast (page 8). Totals were generally below one inch across the Southwest, the High Plains, and North Dakota. Scanty rainfall was reported in central and northern Alaska, where normals are typically quite low during mid-Spring. Hawaii was considerably drier than normal for the fourth month in a row, with most locations receiving two inches or less. During the first four months of 1993, deficits of 7 to 24 inches accumulated throughout the Islands. Only three of the nine NCDC regions reported submedian precipitation, with the Southwest and West ranking 33rd and 35th driest, respectively (page 9). Arizona and Nevada had the 3rd and 6th driest April, respectively, in 99 years of record.

Abnormally cold weather dominated the central and southeastern United States, with departures of –4°F to –6°F covering much of the central Plains and deep South (page 10). According to NCDC, six of the nine regions reported submedian temperatures, with the South and Southeast experiencing the 8th and 9th coldest April, respectively, since 1895 (page 11). Of the 48 contiguous states, 33 observed submedian monthly mean temperatures, with Arkansas and Florida experiencing the 4th coolest April while Louisiana reported the 5th coolest such month since 1895. New Orleans, LA endured the coolest April in 120 years of record (page 12). Across the country as a whole, April 1993 temperatures ranked as the 23rd coolest on record, breaking a string of eight consecutive warmer than normal Aprils.

Unusually warm weather prevailed in the West and the Northeast, with monthly mean temperatures averaging 2°F to 6°F above normal across the desert Southwest (page 10). In addition, Alaska reported abnormally mild weather for the third month in a row. Departures ranged from +2°F to +12°F as several new April average temperature records were established (page 12). Farther south, temperatures were 1°F to 2°F above normal in Hawaii. Only three of the nine NCDC regions reported above median mean temperatures, with the Northeast recording the 34th warmest such month since 1895 (page 11). Arizona and New Hampshire observed the 18th and 19th warmest April, respectively, in the last 99 years.

PRECIPITATION PERCENTILES

APRIL 1993

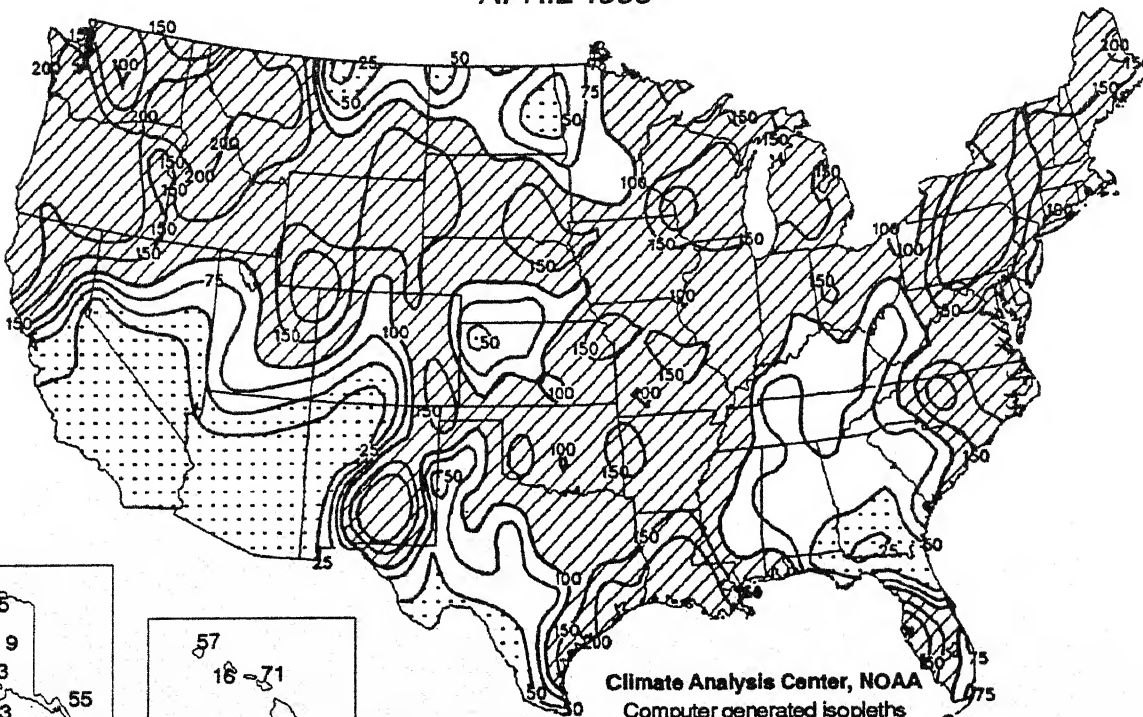


Climate Analysis Center, NOAA

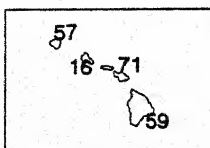
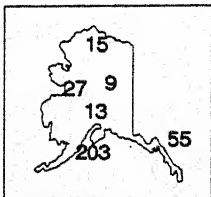
APRIL 1993 Precipitation Percentiles. A wet month ($>70\%$ ile) was observed across much of the northern tier of states, the East Coast, and the western Gulf Coast, with totals among the wettest 10% of the historical (1961–1990) distribution in parts of the Pacific Northwest, upper Great Lakes, and Northeast. Climatologically significant dryness was limited to parts of the Great Basin, northern High Plains, and Southeast.

PERCENT OF NORMAL PRECIPITATION

APRIL 1993



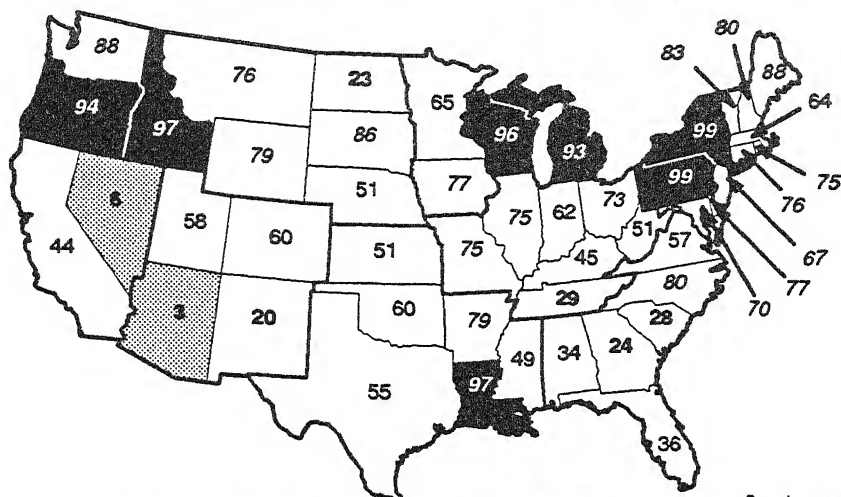
Climate Analysis Center, NOAA
Computer generated isopleths
Based on preliminary data



APRIL 1993 Percent of Normal Precipitation. Hatched areas received above normal precipitation, and dotted areas reported under half of normal. Abnormally wet weather dominated the nation during April 1993. Unusually low amounts were limited to the Southwest, northern Plains, and parts of the Southeast.

HISTORICAL PRECIPITATION RANKINGS BY STATE

APRIL 1993



LEGEND

Among the ten driest

Among the ten wettest

1 - 33: DRY

34 - 66: NEAR NORMAL

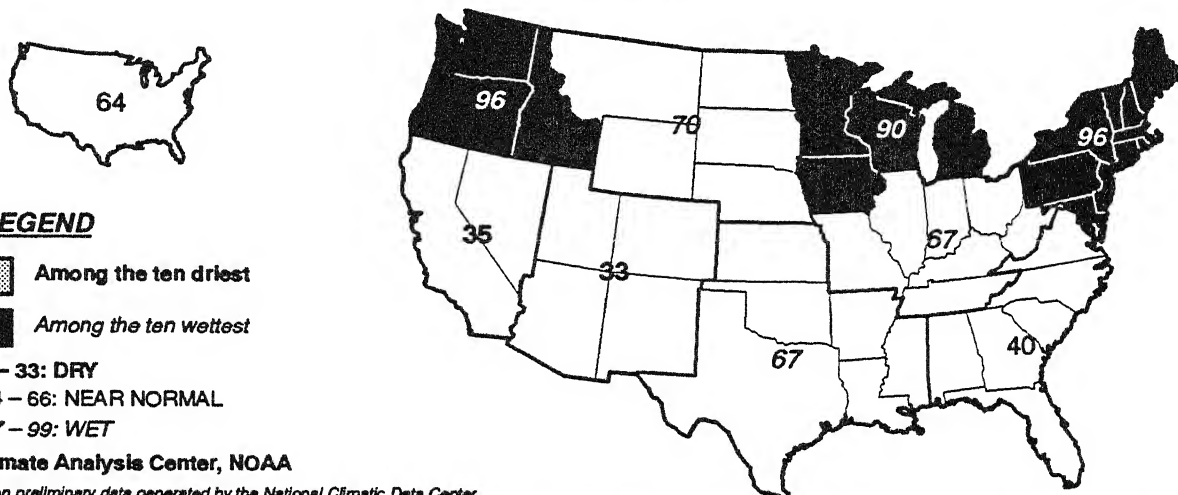
67 - 99: WET

Climate Analysis Center, NOAA

Based on preliminary data generated by the National Climatic Data Center. This chart depicts the ranking of the specific parameter, as measured during the period indicated, with respect to all other such periods on record since 1895.

HISTORICAL PRECIPITATION RANKINGS BY REGION AND NATION

APRIL 1993



LEGEND

Among the ten driest

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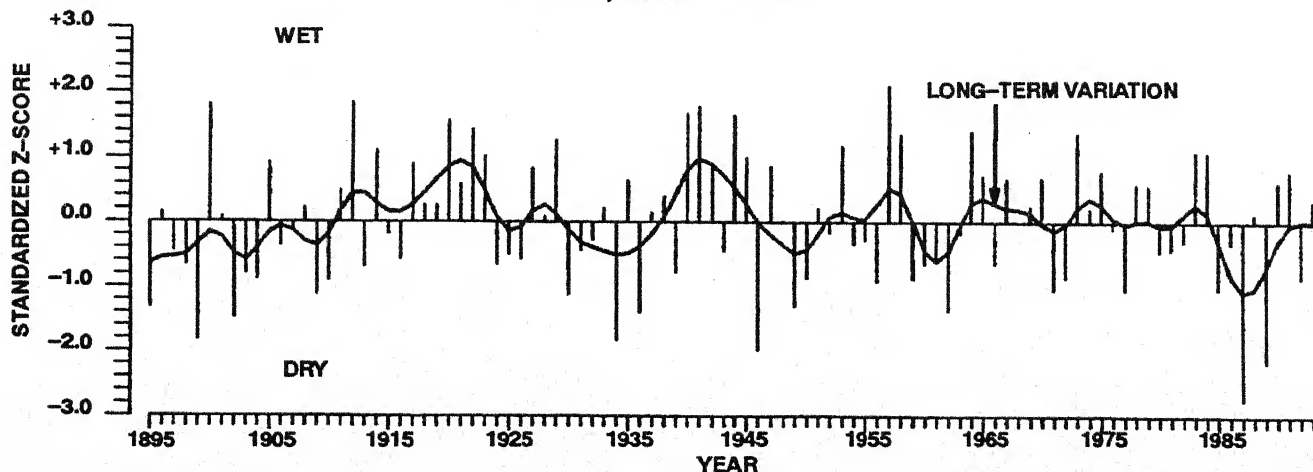
Climate Analysis Center, NOAA

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U. S. NATIONAL NORMALIZED PRECIPITATION INDEX

APRIL, 1895 - 1993

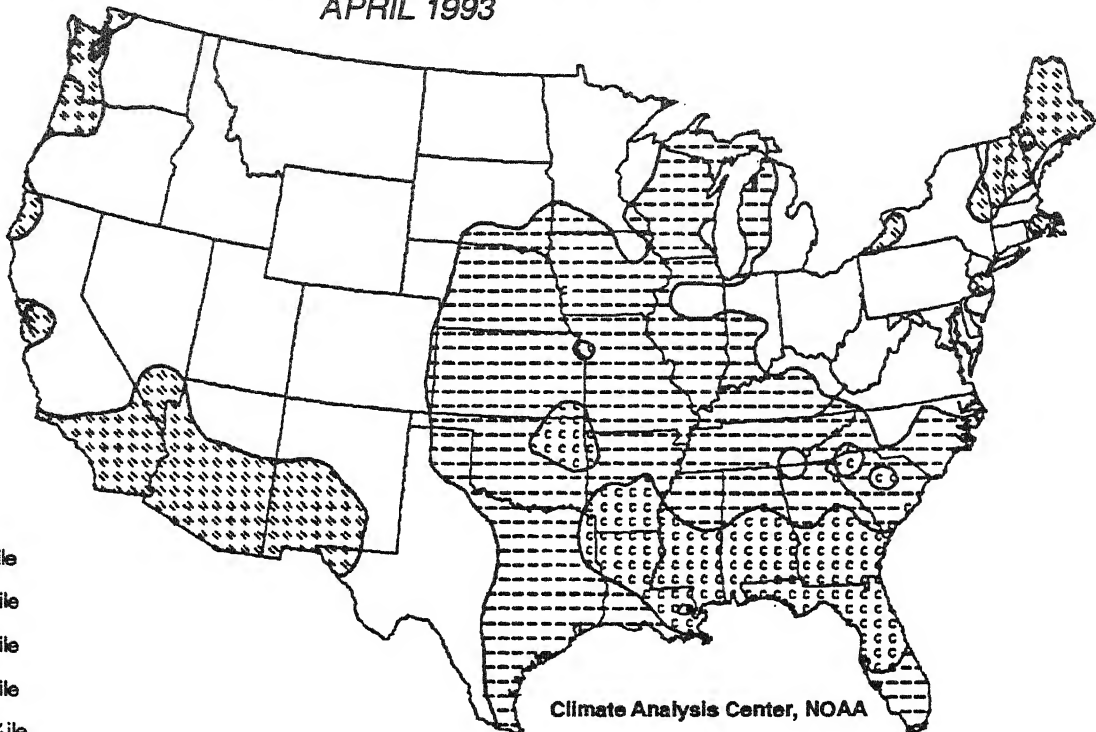
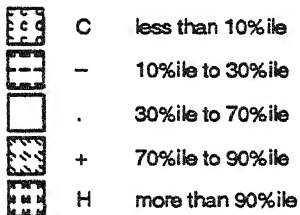
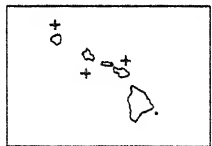
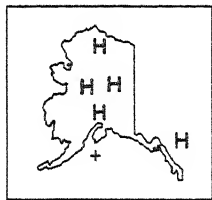


National Climatic Data Center, NOAA

NATIONAL APRIL PRECIPITATION INDEX, as computed by the National Climatic Data Center. April 1993 ranked as the 36th wettest on record. This index takes local normals into account so that regions with large precipitation amounts do not dominate the index value.

TEMPERATURE PERCENTILES

APRIL 1993

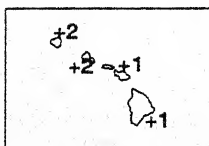
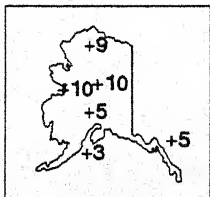
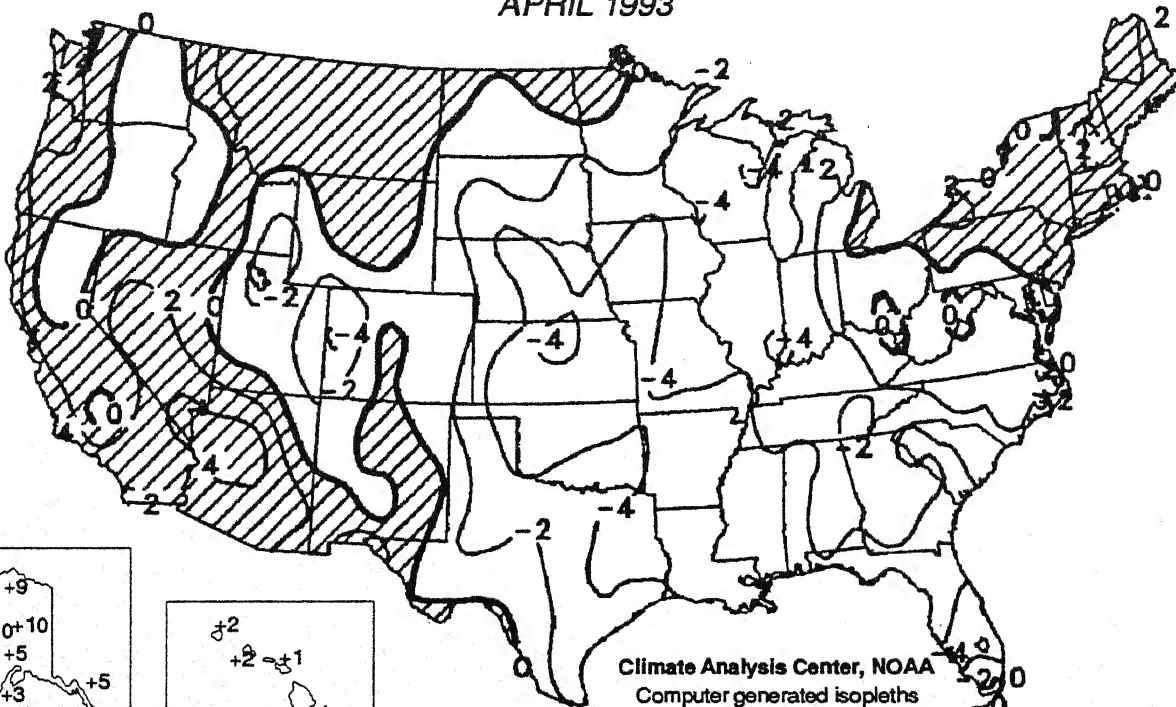


Climate Analysis Center, NOAA

APRIL 1993 Temperature Percentiles. Unusually cold weather (<30%ile) prevailed across most of the central and southeastern states, with monthly mean temperatures among the coldest 10% of the historical (1961-1990) distribution in the Southeast. Abnormally warm conditions (>70%ile) were limited to portions of the Desert Southwest, Pacific Coast, and northern New England.

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

APRIL 1993

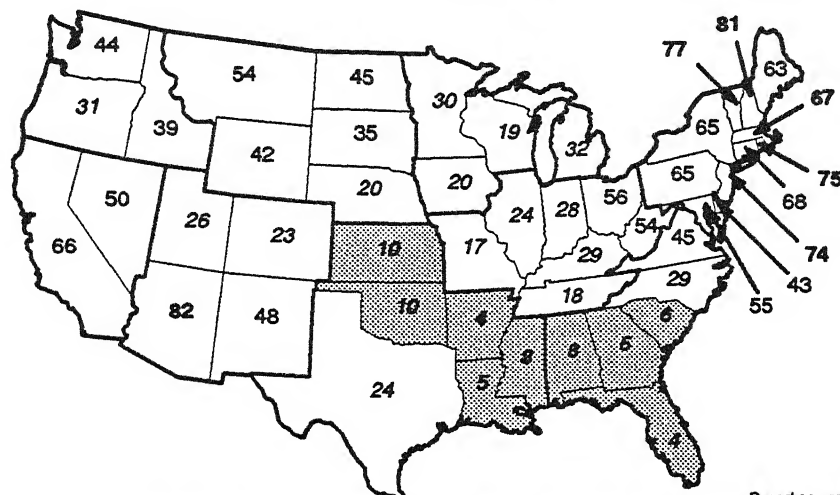


Climate Analysis Center, NOAA
Computer generated isopleths
Based on preliminary data

APRIL 1993 Departure of Average Temperature from Normal (°F). Shaded areas experienced above normal temperatures. Abnormally cold conditions dominated the central and southeastern United States, with monthly mean temperatures averaging 4°F to 6°F below normal in portions of the central Great Plains, lower Mississippi Valley, and Southeast. In contrast, above normal temperatures were observed in the Desert Southwest, Pacific Coast, Northwest, Northeast, Alaska, and Hawaii. Departures approached +6°F in Arizona.

HISTORICAL TEMPERATURE RANKINGS BY STATE

APRIL 1993



LEGEND

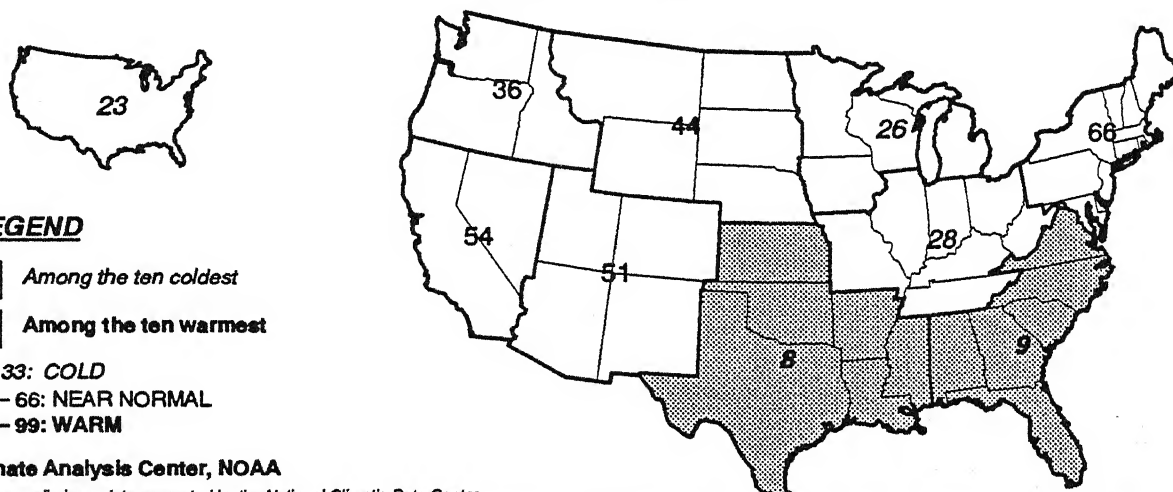
- Among the ten coldest
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- 1 - 33: COLD
- 34 - 66: NEAR NORMAL
- 67 - 99: WARM

Climate Analysis Center, NOAA

Based on preliminary data generated by the National Climatic Data Center. This chart depicts the ranking of the specific parameter, as measured during the period indicated, with respect to all other such periods on record since 1895.

HISTORICAL TEMPERATURE RANKINGS BY REGION AND NATION

APRIL 1993



LEGEND

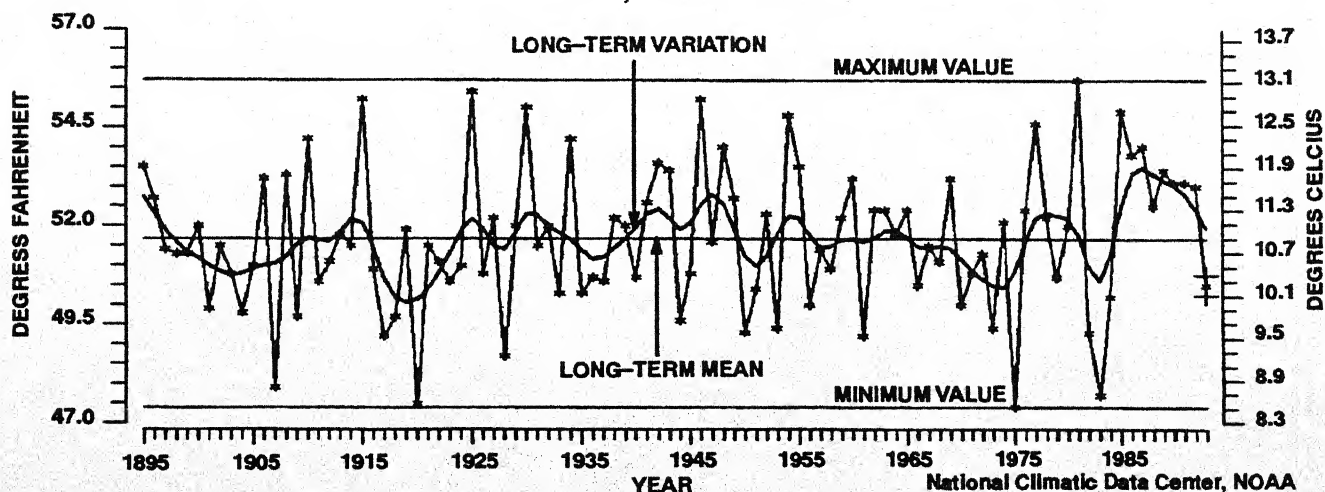
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Climate Analysis Center, NOAA

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U. S. NATIONAL TEMPERATURE

APRIL, 1895 - 1993



NATIONALLY AVERAGED APRIL TEMPERATURES, as computed by the National Climatic Data Center. For the first time since 1984, temperatures averaged below normal across the nation during April 1993, the 23rd coolest on record for the 48 contiguous states.

TABLE 1. RECORD APRIL PRECIPITATION

STATION	TOTAL (IN)	NORMAL (IN)	PCT. OF NORMAL	RECORD TYPE	RECORDS BEGAN
EUGENE, OR	7.85	3.11	252.4	HIGHEST	1951
WILLIAMSPORT, PA	7.41	3.23	229.4	HIGHEST	1947
DAYTON, OH	6.78	3.46	196.0	HIGHEST	1944
OLYMPIA, WA	6.65	3.29	202.1	HIGHEST	1944
SALEM, OR	5.64	2.42	233.1	HIGHEST	1938
SAN DIEGO, CA	0.00	0.79	0.0	LOWEST	1851
LOS ANGELES, CA	0.00	0.72	0.0	LOWEST	1936
TUCSON, AZ	0.00	0.30	0.0	LOWEST	1940
WINSLOW, AZ	0.00	0.26	0.0	LOWEST	1947

NOTE: Trace precipitation is considered ZERO precipitation. Stations with no precipitation are only included if normal precipitation is 0.25 inches or more.
 ***** - Percent of normal not calculable.

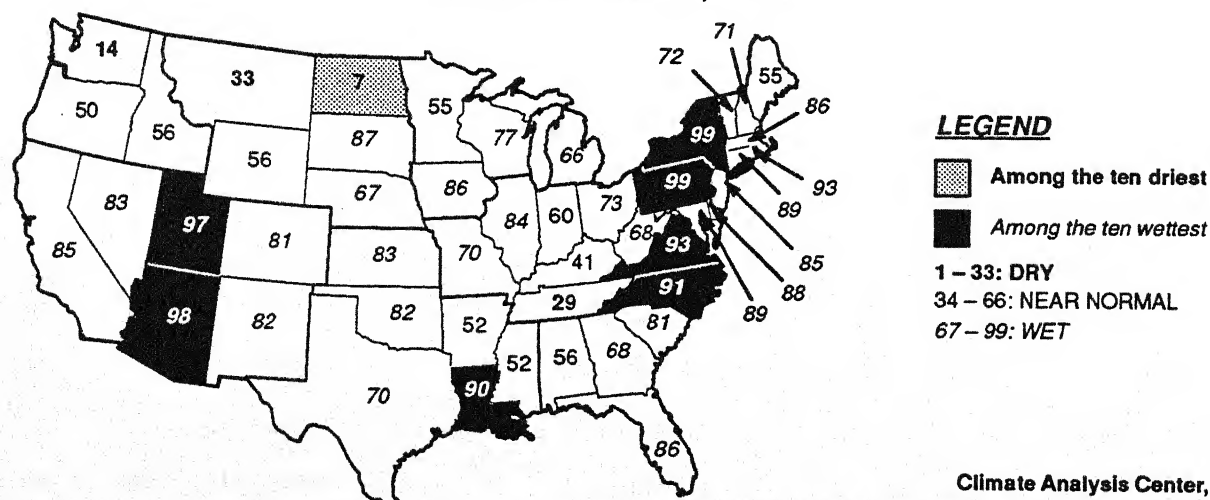
TABLE 2. RECORD APRIL AVERAGE TEMPERATURES

STATION	DEPARTURE (°F)	AVERAGE (°F)	NORMAL (°F)	RECORD TYPE	RECORDS BEGAN
MCGRATH, AK	+10.5	36.9	26.4	HIGHEST	1942
BETTLES, AK	+10.4	31.1	20.7	HIGHEST	1951
KING SALMON, AK	+9.7	41.0	31.3	HIGHEST	1942
BIG DELTA, AK	+9.3	39.7	30.4	HIGHEST	1951
TALKEETNA, AK	+5.8	38.7	32.9	HIGHEST	1951
HOMER, AK	+5.4	40.8	35.4	HIGHEST	1951
CORDOVA, AK	+5.2	41.9	36.7	HIGHEST	1942
SITKA, AK	+4.7	46.4	41.7	HIGHEST	1900
ANNETTE ISLAND, AK	+4.2	47.5	43.3	HIGHEST	1941
NEW ORLEANS, LA	-4.5	64.0	68.5	LOWEST	1874

TABLE 3. RECORD APRIL EXTREME TEMPERATURES

STATION	EXTREME (°F)	DATE OCCURRED	RECORD TYPE	RECORDS BEGAN
NO RECORDS REPORTED				

**FOUR-MONTH HISTORICAL PRECIPITATION RANKINGS BY STATE
 JANUARY – APRIL, 1993**



Climate Analysis Center, NOAA

Based on preliminary data generated by the National Climatic Data Center
 This chart depicts the ranking of the specific parameter, as measured during the period indicated, with respect to all other such periods on record since 1895.